EXHIBIT 11

MAKERDAO

MAKERDAO – ORACLE SECURITY MODULE

Claim	'797 Claims	Use
Claim 1, lines 6-10	A computer based method comprising: creating at least one electronic parallel storage of a differences layer linked to a distributed computer ledger (DCL); the DCL contains an electronic transaction record by a time-sequenced value or a time-sequenced string; NOTES: 1. Computer based method (A0) 2. PSDL (A1) 3. PSDL (A1) linked (A2) to DCL (A2,A3) 4. DCL (A2,A3) containing transaction records (A4), by 5. time sequenced value or string (A5) NARRATIVE: At or around September 2019, MakerDAO built, adopted, and implemented the MakerDAO Oracles Security Modules (the "OSM"). The build and integration of the OSM is reported to be in response to improving the functionality and security of the MakerDAO system, software, and processes (see "Introducing Oracles V2 and DeFi Feeds"). Prior to the OSM build-out, the December 2017 MakerDAO whitepaper (The Dai Stablecoin System Whitepaper, December 2017) writes that market prices will be derived from sources,but provides for no off-chain linked storage or processing. "As of October 7th, 2019, the Oracle Team was mandated, granting the Interim Oracle Team the responsibility of being the intermediary between the Feeds and governance. In the coming months, the process of becoming a Feed will become more clear." – Security – How the Maker Protocol handles the security of oracles "The oracle system for the Maker Protocol uses decentralized reporting to defend against fraudulent price	OPERATION NOTES: - MakerDAO tokens (MKR) are an on-chain cryptocurrency operating on the Ethereum blockchain. - The collateral (cryptocurrencies) sent to MakerDAO are on-chain digital money residing on a blockchain. - The MakerDAO Oracle Security Modules, store values and medians of values off-chain. - The MakerDAO Oracle Security Modules are storage and time-sequencing for market price values propagated from the Oracles. - The MakerDAO Oracle Security Module holds price values for a specified delay period before they are imputed on the blockchain by the system. COMPUTER BASED METHOD – **(A0)** "MakerDAO is an open-source project on the Ethereum blockchain and a Decentralized Autonomous Organization…" – Whitepaper "Vat - The single source of truth for the Maker Protocol. It contains the accounting system of the core Vault, Internal Dai balances, and collateral state. The Vat has no external dependencies and maintains the central "Accounting Invariants" of the Maker Protocol. It houses the public interface for Vault management, allowing urn (Vault) owners to adjust their Vault state balances. It also contains the public interface for Vault fungibility, allowing urn (Vault) owners to transfer, split, and merge Vaults. Excluding these interfaces, the Vat is accessed through trusted smart contract modules." - Maker Protocol 101 CREATING PARALLEL STORAGE OF A DIFFERENCES LAYER – **(A1)** "The oracle system for the Maker Protocol uses decentralized reporting to defend against fraudulent price data." – Security – How the Maker Protocol handles the security of oracles - MakerDAO Documentation

Claim	'797 Claims	Use
	data." – Security – How the Maker Protocol handles the security of oracles - MakerDAO Documentation	"Every time a new list of prices is received, the median of these is computed and used to update <u>the stored value</u>." – Median (<u>emphasis added</u>)

"Oracle Security Modules (OSMs) delay the publishing of new reference prices for a predefined set of time. This parameter is called the Oracle Security Module Delay and was set to be one hour at the launch of MCD." – Security – How the Maker Protocol handles the security of oracles

"The Oracle Security Module(OSM) safeguards the process by delaying price-feed data for one hour." – Security – How the Maker Protocol handles the security of oracles

"Oracles use the median of the reported prices for each asset as the reference price. Using a median instead of an average makes it harder to manipulate the reference price since control over half of the data providers is needed in order for a fraudulent price to be pushed through." – Security – How the Maker Protocol handles the security of oracles

"At the launch of Multi-Collateral Dai, oracles received data from a total of 20 Feeds which consisted of 15 individuals and five public organizations." – Security – How the Maker Protocol handles the security of oracles

<u>DCL IS A LINKED TO THE LEDGER</u>– (**A2**)

"MakerDAO is an open-source project on the Ethereum blockchain and a Decentralized Autonomous Organization…" – Whitepaper

"Dai is a decentralized, unbiased, collateral-backed cryptocurrency soft-pegged to the US Dollar." – Whitepaper

<u>DCL IS DISTRIBUTED</u> – (**A3**)

"The Maker Protocol is the platform through which anyone, anywhere can generate the Dai stablecoin against crypto collateral assets." – MakerDAO Documentation |

Claim	'797 Claims	Use
		MakerDAO is a decentralized organization dedicated to bringing stability to the cryptocurrency economy. – MakerDAO Documentation "Maker Governance is the community organized and operated process of managing the various aspects of the Maker Protocol. Dai is a decentralized, unbiased, collateral-backed cryptocurrency soft-pegged to the US Dollar" – Whitepaper DCL ELECTRONIC TRANSACTION RECORD – **(A4)** "Dai is a decentralized, unbiased, collateral-backed cryptocurrency soft-pegged to the US Dollar." – Whitepaper "The transactionManager service is used to track a transaction's status as it propagates through the blockchain." – Transaction Manager "Methods in Dai.js that start transactions are asynchronous, so they return promises. These promises can be passed as arguments to the transaction manager to set up callbacks when transactions change their status to pending, mined, confirmed or error." – Transaction Manager DCL TIME-SEQUENCED – **(A5)** "This links blocks together (in a chain) because hashes are cryptographically derived from the block data. This prevents fraud, because one change in any block in history would invalidate all the following blocks as all subsequent hashes would change and everyone running the blockchain would notice." – Blocks "The sequence of all blocks that have been committed to the Ethereum network in the history of the network. So-named because each block contains a reference to the previous block, which helps us maintain an ordering over all blocks (and thus over the precise history)." – Intro to Ethereum "Blocks are batches of transactions with a hash of the previous block in the chain." – Blocks
Claim 1, lines 11-19	accessing and storing a value through the at least one electronic parallel storage of the differences layer, the value	ACCESS & STORING VALUE THROUGH PSDL – **(B1)**

Claim	'797 Claims	Use
	from a group comprising of at least one time-sequenced electronically published data stream and at least one descriptive differential, wherein at least one differences processing engine running on a specialized computer system creates and stores parameters from a group comprised of a measurement differences and a descriptive differences; NOTES: 1. access and store a value (B1), through 2. PSDL (A1, B1) 3. value is time sequenced stream OR descriptor (B1,B2) 4. compute and store differences (A1, B1) NARRATIVE: MakerDAO includes centralized (or decentralized) storage and centralized (or decentralized) processing which accesses off-chain data streams, feeds, and differentials for the purposes including, writing and storing these differentials on-chain and off-chain, and having these values and differentials impute or trigger changes to the state of the Ethereum blockchain.	"There are multiple organizations and individuals who report price-data, they are called Feeds." – Security – How the Maker Protocol handles the security of oracles - MakerDAO Documentation A Medianizer is a type of smart-contract in the Maker Protocol's Oracle system that collects price-data from Feeds and calculates a reference price by calculating a median. – Security – How the Maker Protocol handles the security of oracles "Every time a new list of prices is received, the median of these is computed and used to update the stored value." – Median (emphasis added) "The published prices are pooled together into a canonical price in a smart contract that can then be used by a decentralized application (dapp)." - Introducing Oracles "At the launch of Multi-Collateral Dai, oracles received data from a total of 20 Feeds which consisted of 15 individuals and five public organizations." – Security – How the Maker Protocol handles the security of oracles "All new Feeds go through MakerDAO's governance in order to be added in. There is currently no formal way for Feeds to be added to the Maker Protocol." – Security – How the Maker Protocol handles the security of oracles "There are two types of Feeds; Dark Feeds run by anonymous individuals, and Light Feeds run by public organizations. Individuals consist of people internal to Maker, influential people in the greater crypto community, as well as some community members." – Security – How the Maker Protocol handles the security of oracles "Vat - The single source of truth for the Maker Protocol. It contains the accounting system of the core Vault, Internal Dai balances, and collateral state. The Vat has no external dependencies and maintains the central "Accounting Invariants" of the Maker Protocol. It houses the public interface for Vault management, allowing urn (Vault) owners to

Claim	'797 Claims	Use
		adjust their Vault state balances. It also contains the public interface for Vault fungibility, allowing urn (Vault) owners to transfer, split, and merge Vaults. Excluding these interfaces, the Vat is accessed through trusted smart contract modules." - Maker Protocol 101 "Prices are retrieved from chain every second. The average of last 60 prices are reported to subscribed clients." – uniswap-price-feed "Oracles, collectively, are a mechanism to broadcast data from outside of the blockchain onto the blockchain." – Introducing Oracles <u>TIME SEQUENCED</u> – **(B2)** "The primary and only entity this service operates on is feed. Each feed is effectively a stream of timestamped records. Timestamps never go back and it is always guaranteed that new records will be added 'after' the existing ones. This simplification makes feed streams consumption much easier for clients." – uniswap-price-feed "Each record is represented throughout the service as a JSON structure with two fields: timestamp and data . The first one is a UNIX epoch timestamp represented as a number (either integer or floating-point). The latter can be basically anything." – uniswap-price-feed "The primary and only entity this service operates on is feed. Each feed is effectively a stream of timestamped records. Timestamps never go back and it is always guaranteed that new records will be added 'after' the existing ones. This simplification makes feed streams consumption much easier for clients." – uniswap-price-feed
Claim 1, lines 20-28	storing the DCL containing an electronic transactions record on at least one of a distributed network of connected independent computers or a decentralized network of computers wherein the electronic transaction record is time sequenced, and a writing or an appending of the electronic transaction records is performed on the distributed network of connected independent computers or the decentralized network of computers; NOTES:	<u>STORING DCL DECENTALIZED OR DISTRIBUTED</u> – **(C1)** "With the new version of the Maker Protocol, Multi Collateral Dai (MCD), being released and live on the main Ethereum network" - MakerDAO Documentation "The Maker Protocol is the platform through which anyone, anywhere can generate the Dai stablecoin against crypto collateral assets." – MakerDAO Documentation

Claim	'797 Claims	Use
	1. store DCL on distributed or decentralized (C1), 2. transaction records (A4, A1) are time sequenced (A5, B2), 3. writing or appending is performed on distributed or decentralized (C1, C2)	"MakerDAO is a decentralized organization dedicated to bringing stability to the cryptocurrency economy." – MakerDAO Documentation STORED DCL TRANSACTION RECORDS, WRITING/APPENDING – **(C2)** "The sequence of all blocks that have been committed to the Ethereum network in the history of the network. So-named because each block contains a reference to the previous block, which helps us maintain an ordering over all blocks (and thus over the precise history)." - Intro to Ethereum "Blocks are batches of transactions with a hash of the previous block in the chain. This links blocks together (in a chain) because hashes are cryptographically derived from the block data. This prevents fraud, because one change in any block in history would invalidate all the following blocks as all subsequent hashes would change and everyone running the blockchain would notice" – Blocks "Vat - The single source of truth for the Maker Protocol. It contains the accounting system of the core Vault, Internal Dai balances, and collateral state. The Vat has no external dependencies and maintains the central "Accounting Invariants" of the Maker Protocol. It houses the public interface for Vault management, allowing urn (Vault) owners to adjust their Vault state balances. It also contains the public interface for Vault fungibility, allowing urn (Vault) owners to transfer, split, and merge Vaults. Excluding these interfaces, the Vat is accessed through trusted smart contract modules." - Maker Protocol 101
Claim 1, lines 29-36	storing the at least one electronic parallel storage of the differences layer on at least one of a centralized storage device controlled by the specialized computer system or a decentralized storage device controlled by the specialized computer system for increasing functionality and utility of the DCL, reducing data storage requirements, eliminating transmission of redundant data, and improving data security; NOTES:	STORING THROUGH PSDL – **(D1)** see A1, also "Every time a new list of prices is received, the median of these is computed and used to update the stored value." – Median (emphasis added)

Claim	'797 Claims	Use
	1. storing PSDL (A1, B1) on centralized or decentralized (A1) 2. increasing functionality, utility of DCL (D2) 3. reducing data storage, redundant transmission (D3) 4. increase data security (D3)	"…the price (val) is intentionally kept not public because the intention is to only read it from the two functions read and peek , which are whitelisted. This means that you need to be authorized." - Median INCREASED FUNCTIONALITY AND UTILITY – **(D2)** "Component Spotter - The Maker Protocol requires real time information about the market price of the assets used as collateral in Vaults. Ultimately, this market price determines the amount of Dai that can be minted, as well as the grab condition for Vault liquidations. The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101 (emphasis added) "Oracle Security Modules (OSMs) delay the publishing of new reference prices for a predefined set of time. This parameter is called the Oracle Security Module Delay and was set to be one hour at the launch of MCD." – Security – How the Maker Protocol handles the security of oracles "Oracles use the median of the reported prices for each asset as the reference price. Using a median instead of an average makes it harder to manipulate the reference price since control over half of the data providers is needed in order for a fraudulent price to be pushed through." – Security – How the Maker Protocol handles the security of oracles "Vat - The single source of truth for the Maker Protocol. It contains the accounting system of the core Vault, Internal Dai balances, and collateral state. The Vat has no external dependencies and maintains the central "Accounting Invariants" of the Maker Protocol." – Maker Protocol 101 "The OSM (named via acronym from "Oracle Security Module") ensures that new price values propagated from the Oracles are not taken up by the system until a specified delay has passed." – Oracle Security Module The central mechanism of the OSM is to periodically feed a delayed price into the MCD system for a particular collateral type. For this to work properly, an external actor must regularly call the poke() method

Claim	'797 Claims	Use
		to update the current price and read the next price. – Oracle Security Module (emphasis added)
		DCL –<u>REDUCED STORAGE, REDUNDANT DATA, DATA SECURITY</u> – **(D3)**
		"To protect the system from an attacker attempting to gain control of a majority of the Oracles, the Maker Protocol receives price inputs through the Oracle Security Module (OSM), not from the Oracles directly. The OSM, which is a layer of defense between the Oracles and the Protocol, delays a price for one hour, allowing Emergency Oracles or a Maker Governance vote to freeze an Oracle if it is compromised." – Whitepaper
		"The Oracle Security Module (OSM) <u>safeguards</u> the process by delaying price-feed data for one hour." – Security – How the Maker Protocol handles the security of oracles (<u>emphasis added</u>)
		"The oracle system for the Maker Protocol uses decentralized reporting to <u>defend against fraudulent price data</u>." – Security – How the Maker Protocol handles the security of oracles – MakerDAO (<u>emphasis added</u>)
		"This allows MKR token holders and other stakeholders the time to react to bugs or attacks on the Oracles. An OSM is active on each Oracle in the Maker Protocol." – Security – How the Maker Protocol handles the security of oracles
		"A Medianizer is a type of smart-contract in the Maker Protocol's Oracle system that collects price-data from Feeds and calculates a reference price by calculating a median." – Security – How the Maker Protocol handles the security of oracles
		"The Medianizer maintains a white-list of Feeds that can be controlled by MakerDAO governance. Every time a new set of price updates is received, the reference price is recalculated and queued into the Oracle Security Module which publishes the price after a delay period." – Security – How the Maker Protocol handles the security of oracles

Claim	'797 Claims	Use
		"Any time the collateral value of a Vault gets closer to its debt, it becomes "risky-er". The system liquidates Vaults that get too risky." – Maker Protocol 101

"Prices are retrieved from chain every second. The average of last 60 prices are reported to subscribed clients." – uniswap-price-feed

"There are two types of Feeds; Dark Feeds run by anonymous individuals, and Light Feeds run by public organizations. Individuals consist of people internal to Maker, influential people in the greater crypto community, as well as some community members." – Security – How the Maker Protocol handles the security of oracles

"Oracles use the median of the reported prices for each asset as the reference price. Using a median instead of an average makes it harder to manipulate the reference price since control over half of the data providers is needed in order for a fraudulent price to be pushed through." – Security – How the Maker Protocol handles the security of oracles

"This links blocks together (in a chain) because hashes are cryptographically derived from the block data. This prevents fraud, because one change in any block in history would invalidate all the following blocks as all subsequent hashes would change and everyone running the blockchain would notice." - Blocks

"Vat - The single source of truth for the Maker Protocol. It contains the accounting system of the core Vault, Internal Dai balances, and collateral state. The Vat has no external dependencies and maintains the central "Accounting Invariants" of the Maker Protocol." – Maker Protocol 101 |
| Claim 1, lines 37-40 | linking the electronic transaction record in the DCL to records of the at least one electronic parallel storage of the differences layer utilizing at least one time sequenced value, string, code, or key; and

NOTES: | LINKING – **(E1)**

"Component Spotter - The Maker Protocol requires real time information about the market price of the assets used as collateral in Vaults. Ultimately, this market price determines the amount of Dai that can be minted, as well as the grab condition for Vault liquidations. The |

Claim	'797 Claims	Use
	1. link (E1) DCL transaction records (A2, A4) to PSDL records (A1, B1, B2), 2. utilizing time seq. value, string, code, or key (E1, A5, C2)	oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101 "An oracle module is deployed for each collateral type. It feeds price data for a corresponding collateral type to the Vat." - Maker Protocol 101 "Each record is represented throughout the service as a JSON structure with two fields: timestamp and data . The first one is <u>a UNIX epoch timestamp represented as a number</u> (either integer or floating-point). The latter can be basically anything." – uniswap-price-feed (<u>emphasis added</u>) "Oracle Security Modules (OSMs) delay the publishing of new reference prices for a predefined set of time. This parameter is called the Oracle Security Module Delay and was set to be one hour at the launch of MCD." – Security – How the Maker Protocol handles the security of oracles "The Medianizer maintains a white-list of Feeds that can be controlled by MakerDAO governance. Every time a new set of price updates is received, the reference price is recalculated and queued into the Oracle Security Module which publishes the price after a delay period." – Security – How the Maker Protocol handles the security of oracles "Components: Dai - An extension from DS-Token and standard ERC20 token interface. Contains the database of Dai token owners, transfer, approval and supply logic." - Maker Protocol 101 "The primary and only entity this service operates on is feed. Each feed is effectively a stream of timestamped records. Timestamps never go back and it is always guaranteed that new records will be added 'after' the existing ones. This simplification makes feed streams consumption much easier for clients." – uniswap-price-feed "val - the price (private) must be read with read() or peek() age - the Block timestamp of last price val update wat - the price oracles type (ex: ETHUSD) / tells us what the type of asset is" – Median

Claim	'797 Claims	Use
		"…the price (val) is intentionally kept not public because the intention is to only read it from the two functions read and peek , which are whitelisted. This means that you need to be authorized." - Median "The bud is modified to get whitelisted authorities to read it on-chain (permissioned), whereas, everything of off-chain is public." – Median "In the case of it being an authorized oracle, it will check if it signed the message with a timestamp that is greater than the last one. This is done for the purpose of ensuring that it is not a stale message. The next step is to check for order values, this requires that you send everything in an array that is formatted in ascending order." – Median "Values are read from a designated DSValue contract (its address is stored in src). The purpose of this delayed updating mechanism is to ensure that there is time to detect and react to an Oracle attack (e.g. setting a collateral's price to zero). Responses to this include calling stop() or void(), or triggering Emergency Shutdown." – Oracle Security Module
Claim 1, lines 41-44	imputing at least one measured differential with a descriptive identifier or at least one descriptive identifier to the electronic transaction record of the DCL through data storage and processing on the at least one electronic parallel storage of the differences layer. NOTES: 1. impute differential or descriptor to DCL records (F1) through, 2. data storage and processing on PSDL (A1, F2) NARRATIVE: Records on the blockchain system are processed and the state of the Ethereum blockchain is altered by linked differentials stored on the PSDL(s).	<u>DCL IMPUTING MEASURED DIFFERENTIAL OR DESCRIPTIVE ID.</u> – **(F1)** "The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101 "Oracles, collectively, are a mechanism to broadcast data from outside of the blockchain onto the blockchain." – Introducing Oracles "Component Spotter - The Maker Protocol requires real time information about the market price of the assets used as collateral in Vaults. Ultimately, this market price determines the amount of Dai that can be minted, as well as the grab condition for Vault liquidations. <u>The oracle module handles how markets prices are recorded on the blockchain.</u>" - Maker Protocol 101 (<u>emphasis added</u>) "A large Vault becomes undercollateralized due to market conditions. An Auction Keeper then detects the undercollateralized Vault

Claim	'797 Claims	Use
		opportunity and initiates liquidation of the Vault, which kicks off a Collateral Auction for, say, 50 ETH." – Whitepaper "Any time the collateral value of a Vault gets closer to its debt, it becomes "risky-er". The system liquidates Vaults that get too risky." – Maker Protocol 101 "ETHUSD shutdown (can still add collateral and pay back debt - increases safety) but you cannot do anything that increases risk (decreases safety - remove collateral, generate dai, etc.) because the system would not know if you would be undercollateralized." – Median "Values are read from a designated DSValue contract (its address is stored in src). The purpose of this delayed updating mechanism is to ensure that there is time to detect and react to an Oracle attack (e.g. setting a collateral's price to zero). Responses to this include calling stop() or void(), or triggering Emergency Shutdown." – Oracle Security Module "The Maker Protocol requires real-time information about the market price of the collateral assets in Maker Vaults in order to know when to trigger Liquidations." – Whitepaper

"Blocks" - – Ethereum.org developers docs, https://ethereum.org/en/developers/docs/blocks/

Ethereum Blocks, Ethereum -> Docs -> Blocks, https://ethereum.org/en/developers/docs/blocks/

"Intro to Ethereum" – Ethereum.org developers docs, https://ethereum.org/en/developers/docs/intro-to-ethereum/

"Introducing Oracles V2 and DeFi Feed", MakerDAO Blog, September 3, 2019, Introducing Oracles V2 and DeFi Feeds (makerdao.com)

"Introduction", Maker DAO Documentation https://docs.makerdao.com/

"Maker Protocol 101", Ken Wouter, Soren, Tom, and Chris B. – Maker Foundation "please submit errors to kenton@makerdao.com https://docs.makerdao.com/getting-started/maker-protocol-101

"MakerDAO Documentation", Maker Docs, https://docs.makerdao.com/

"Median – Detailed Documentation", Maker Docs, https://docs.makerdao.com/smart-contract-modules/oracle-module/median-detailed-documentation

"Oracle Security Module – Detailed Documentation", MakerDAO Docs, https://docs.makerdao.com/smart-contract-modules/oracle-module/oracle-security-module-osm-detailed-documentation

"Security – How the Maker Protocol handles the security of oracles", Security | Maker DAO Community Portal, https://makerdao.world/en/learn/Oracles/security/

"Transaction Manager" – MakerDAO Documentation, https://docs.makerdao.com/build/dai.js/advanced-configuration/transactions

"uniswap-price-feed" Github at uniswap-price-feed/README.md at master · makerdao/uniswap-price-feed

"Whitepaper" - The Maker Protocol: MakerDAO's Multi-Collateral Dai (MCD) System, https://makerdao.com/en/whitepaper/

MAKERDAO – ORACLE SECURITY MODULE

Claim	'797 Claims	Use
Claim 7, lines 18-23	a system having a memory device, the memory device further including a Random Access Memory (RAM); a processor connected to the memory device, the processor is configured to: create at least one electronic parallel storage of a differences layer linked to a distributed computer ledger (DCL), both the electronic parallel storage of the differences layer and the DCL containing a respective electronic transaction record, a time-sequenced value, or a time-sequenced string; NOTES: 1. a system (A1) 2. create PSDL (A2) 3. linked (A3) to a DCL (A4, A3) 4. PSDL (transactions, or value, or string) (A2) 5. DCL (transactions, or value, or string) (A5) NARRATIVE: At or around September 2019, MakerDAO built, adopted, and implemented the MakerDAO Oracles Security Modules (the "OSM"). The build and integration of the OSM is reported to be in response to improving the functionality and security of the MakerDAO system, software, and processes (see "Introducing Oracles V2 and DeFi Feeds"). Prior to the OSM build-out, the December 2017 MakerDAO whitepaper (The Dai Stablecoin System Whitepaper, December 2017) writes that market prices will be derived from sources, but provides for no off-chain linked storage or processing. "As of October 7th, 2019, the Oracle Team was mandated, granting the Interim Oracle Team the responsibility of being the intermediary between the Feeds and governance. In the coming months, the process of becoming a Feed will become more	<u>SYSTEM HAVING A MEMORY DEVICE, RAM</u> – **(A1)** "MakerDAO is an open-source project on the Ethereum blockchain and a Decentralized Autonomous Organization…" – Whitepaper "Vat - The single source of truth for the Maker Protocol. It contains the accounting system of the core Vault, Internal Dai balances, and collateral state. The Vat has no external dependencies and maintains the central "Accounting Invariants" of the Maker Protocol." – Maker Protocol 101 "Every time a new list of prices is received, the median of these is computed and used to update the stored value." – Median (emphasis added) "MKR is a cryptographic governance token used in the Dai System and Software, which is an autonomous system of smart contracts on the Ethereum Blockchain (the "Open Source Software"), that permits, among other things, the generation of Dai." – Terms of Use "2. Module Details Glossary (DAI) Key Functionalities (as defined in the smart contract) Mint - Mint to an address Burn - Burn at an address" – Dai Module "Values are read from a designated DSValue contract (its address is stored in src). The purpose of this delayed updating mechanism is to ensure that there is time to detect and react to an Oracle attack (e.g. setting a collateral's price to zero). Responses to this include calling stop() or void(), or triggering Emergency Shutdown." – Oracle Security Module

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	clear." – Security – How the Maker Protocol handles the security of oracles "The oracle system for the Maker Protocol uses decentralized reporting to defend against fraudulent price data." – Security – How the Maker Protocol handles the security of oracles - MakerDAO Documentation	"By distributing data across a network of computers, the technology allows any group of individuals to embrace transparency rather than central-entity control." - Whitepaper Note: the system to include all centralized and decentralized components CREATE PARALLEL STORAGE OF A DIFFERENCES LAYER (PSDL) – **(A2)** "To protect the system from an attacker attempting to gain control of a majority of the Oracles, the Maker Protocol receives price inputs through the Oracle Security Module (OSM), not from the Oracles directly. The OSM, which is a layer of defense between the Oracles and the Protocol, delays a price for one hour, allowing Emergency Oracles or a Maker Governance vote to freeze an Oracle if it is compromised." – Whitepaper "Component Spotter - The Maker Protocol requires real time information about the market price of the assets used as collateral in Vaults. Ultimately, this market price determines the amount of Dai that can be minted, as well as the grab condition for Vault liquidations. The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101 "The Medianizer maintains a white-list of Feeds that can be controlled by MakerDAO governance. Every time a new set of price updates is received, the reference price is recalculated and queued into the Oracle Security Module which publishes the price after a delay period." – Security – How the Maker Protocol handles the security of oracles "OSM (Oracle Security Module) - Authorized users are allowed to set a value after some duration of time (e.g. one hour). To protect the system from an attacker who gains control of a majority of the oracles, the OSM imposes a 1 hour delay on price feeds, leaving enough time for the MKR governance community to analyze the data and react." – Maker Protocol

Claim	'797 Claims	Use
		<u>PSDL LINKED TO A DISTRIBUTED COMPUTER LEDGER</u> – **(A3)**
		"The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101
		"Oracles, collectively, are a mechanism to broadcast data from outside of the blockchain onto the blockchain." – Introducing Oracles
		"The Oracle Security Module(OSM) safeguards the process by delaying price-feed data for one hour." – Security – How the Maker Protocol handles the security of oracles
		<u>A DISTRIBUTED COMPUTER LEDGER</u> – **(A4)**
		"With the new version of the Maker Protocol, Multi Collateral Dai (MCD), being released and live on the main Ethereum network" - MakerDAO Documentation
		"The Maker Protocol is the platform through which anyone, anywhere can generate the Dai stablecoin against crypto collateral assets." – MakerDAO Documentation
		"Blocks are batches of transactions with a hash of the previous block in the chain." – Blocks
		"This links blocks together (in a chain) because hashes are cryptographically derived from the block data. This prevents fraud, because one change in any block in history would invalidate all the following blocks as all subsequent hashes would change and everyone running the blockchain would notice." - Blocks
		"MakerDAO is a decentralized organization dedicated to bringing stability to the cryptocurrency economy." – MakerDAO Documentation
		"Maker Governance is the community organized and operated process of managing the various aspects of the Maker Protocol. Dai is

Claim	'797 Claims	Use
		a decentralized, unbiased, collateral-backed cryptocurrency soft-pegged to the US Dollar" – Whitepaper DISTRIBUTED LEDGER CONTAINS – **(A5)** "Dai is a decentralized, unbiased, collateral-backed cryptocurrency soft-pegged to the US Dollar." – Whitepaper "The transactionManager service is used to track a transaction's status as it propagates through the blockchain." – Transaction Manager "Methods in Dai.js that start transactions are asynchronous, so they return promises. These promises can be passed as arguments to the transaction manager to set up callbacks when transactions change their status to pending, mined, confirmed or error." – Transaction Manager
Claim 7, lines 24-26	access a value from a group comprising of at least one time-sequenced electronically published data stream and at least one descriptive differential; NOTE: 1. access a value (B1, A2), 2. …at least one descriptive differential (A2)	ACCESS A VALUE – **(B1)** "There are multiple organizations and individuals who report price-data, they are called Feeds." – Security – How the Maker Protocol handles the security of oracles - MakerDAO Documentation "An oracle module is deployed for each collateral type. It feeds price data for a corresponding collateral type to the Vat." - Maker Protocol 101 "Each record is represented throughout the service as a JSON structure with two fields: timestamp and data . The first one is a UNIX epoch timestamp represented as a number (either integer or floating-point). The latter can be basically anything." – uniswap-price-feed (emphasis added) "The published prices are pooled together into a canonical price in a smart contract that can then be used by a decentralized application (dapp)." - Introducing Oracles

Claim	'797 Claims	Use
		"Component Spotter - The Maker Protocol requires real time information about the market price of the assets used as collateral in Vaults. Ultimately, this market price determines the amount of Dai that can be minted, as well as the grab condition for Vault liquidations. The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101

Claim 7, lines 27-31	store the values from a group comprising of at least one time-sequenced electronically published data stream and at least one descriptive differential on the at least one electronic parallel storage of the differences layer;
	
	NOTES
	
	    1. store values on PSDL (C1),
	    2. …at least one descriptive differential (C1)
		<u>STORE VALUES ON PSDL</u> – **(C1)**
		
		"Every time a new list of prices is received, the median of these is computed and used to update the stored value." – Median (emphasis added)
		
		"Whitelisted addresses broadcast price updates off-chain, which are fed into a medianizer before being pulled into the OSM. The Spotter reads from the OSM." - Maker Protocol 101
		
		"An oracle module is deployed for each collateral type. It feeds price data for a corresponding collateral type to the Vat." - Maker Protocol 101
		
		"Each record is represented throughout the service as a JSON structure with two fields: timestamp and data . The first one is a UNIX epoch timestamp represented as a number (either integer or floating-point). The latter can be basically anything." – uniswap-price-feed (emphasis added)
		
		"The MakerDAO Feed Dashboard illustrates the prices from the 14 Feeds that currently make up the ETHUSD Oracle price used by Single-Collateral Dai." - Introducing Oracles
		
		Organizations involved in being Feeds at the launch of MCD can be found in the Feeds list. – Security – How the Maker Protocol handles the security of oracles

Claim 7, lines 32-36	align and link a stored value record of the at least one electronic parallel storage of the differences layer to the electronic transaction record of the DCL utilizing at least one time sequenced value, string, code, or key; and	<u>ALIGN AND LINK</u> – **(D1)** "Oracle Security Modules (OSMs) delay the publishing of new reference prices for a predefined set of time. This parameter is called

Claim	'797 Claims	Use
	NOTES: 1. align and link PSDL stored value to DCL, (D1, A3) 2. utilizing time seq. value, string, code, or key (D1, D2)	the Oracle Security Module Delay and was set to be one hour at the launch of MCD." – Security – How the Maker Protocol handles the security of oracles "The Oracle Security Module(OSM) safeguards the process by delaying price-feed data for one hour." – Security – How the Maker Protocol handles the security of oracles "Each record is represented throughout the service as a JSON structure with two fields: timestamp and data . The first one is a UNIX epoch timestamp represented as a number (either integer or floating-point). The latter can be basically anything." – uniswap-price-feed (emphasis added) "The primary and only entity this service operates on is feed. Each feed is effectively a stream of timestamped records. Timestamps never go back and it is always guaranteed that new records will be added 'after' the existing ones. This simplification makes feed streams consumption much easier for clients." – uniswap-price-feed <u>UTILIZING A STRING, CODE, OR KEY</u> – **(D2)** "The primary and only entity this service operates on is feed. Each feed is effectively a stream of timestamped records. Timestamps never go back and it is always guaranteed that new records will be added 'after' the existing ones. This simplification makes feed streams consumption much easier for clients." – uniswap-price-feed "Each record is represented throughout the service as a JSON structure with two fields: timestamp and data . The first one is a UNIX epoch timestamp represented as a number (either integer or floating-point). The latter can be basically anything." – uniswap-price-feed "The primary and only entity this service operates on is feed. Each feed is effectively a stream of timestamped records. Timestamps never go back and it is always guaranteed that new records will be added 'after' the existing ones. This simplification makes feed streams consumption much easier for clients." – uniswap-price-feed

Claim	'797 Claims	Use
		"In the case of it being an authorized oracle, it will check if it signed the message with a timestamp that is greater than the last one. This is done for the purpose of ensuring that it is not a stale message. The next step is to check for order values, this requires that you send everything in an array that is formatted in ascending order." – Median
Claim 7, lines 37-40	impute at least one measured differential with a descriptive identifier or at least one descriptive identifier to the electronic transaction record of the DCL. NOTES: 1. impute measured differential (E1) or descriptor (E1) to DCL	<u>IMPUTING MEASURED DIFF. OR DESCRIPTIVE ID.</u> – **(E1)** "The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101 "Oracles, collectively, are a mechanism to broadcast data from outside of the blockchain onto the blockchain." – Introducing Oracles "Component Spotter - The Maker Protocol requires real time information about the market price of the assets used as collateral in Vaults. Ultimately, this market price determines the amount of Dai that can be minted, as well as the grab condition for Vault liquidations. The oracle module handles how markets prices are recorded on the blockchain." - Maker Protocol 101 (emphasis added) "A large Vault becomes undercollateralized due to market conditions. An Auction Keeper then detects the undercollateralized Vault opportunity and initiates liquidation of the Vault, which kicks off a Collateral Auction for, say, 50 ETH." – Whitepaper "The published prices are pooled together into a canonical price in a smart contract that can then be used by a decentralized application (dapp)." .- Introducing Oracles The Maker Protocol requires real-time information about the market price of the collateral assets in Maker Vaults in order to know when to trigger Liquidations. – Whitepaper

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